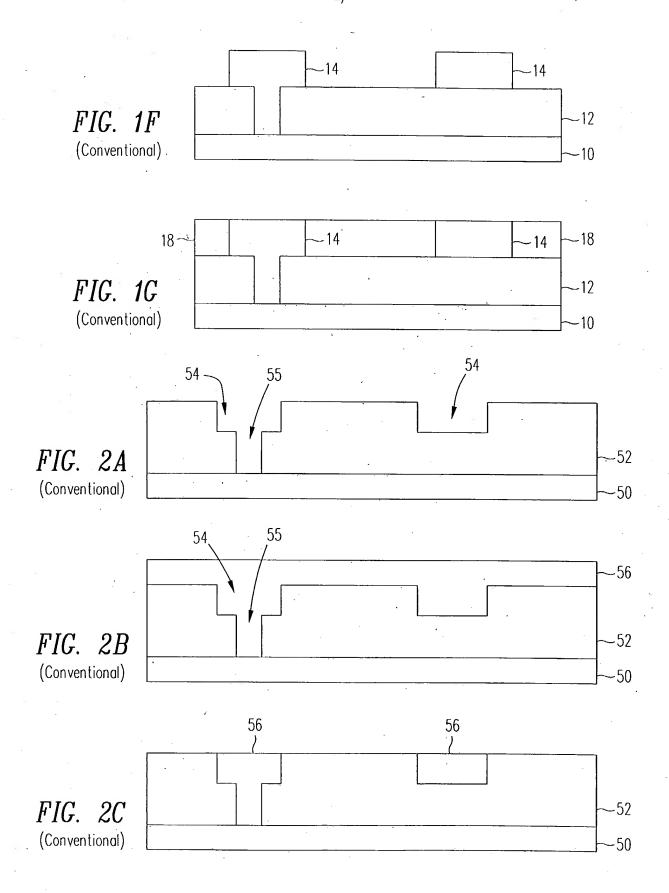


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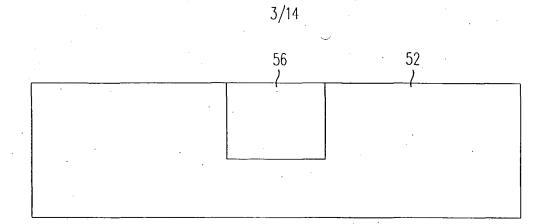


FIG. 3 (Conventional)

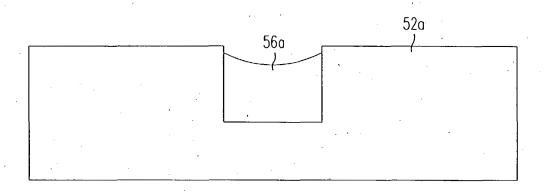


FIG. 4 (Conventional)

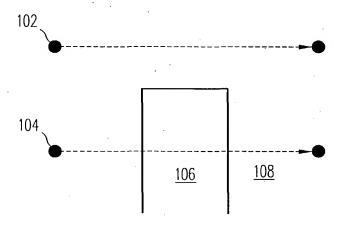
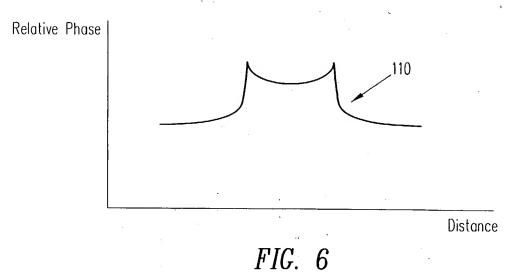
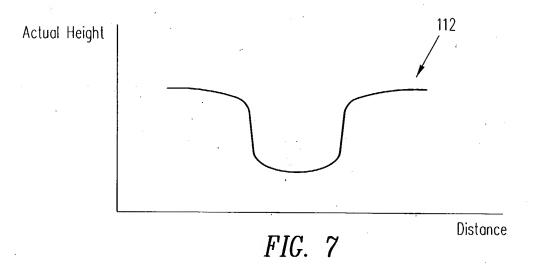


FIG. 5





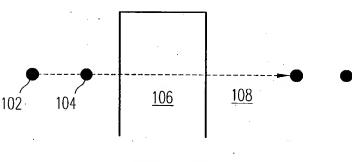
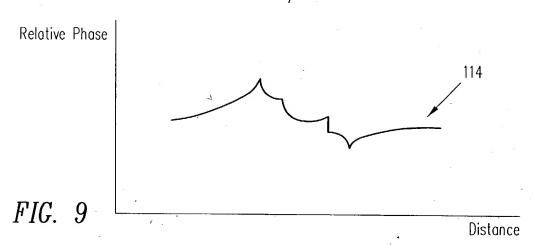
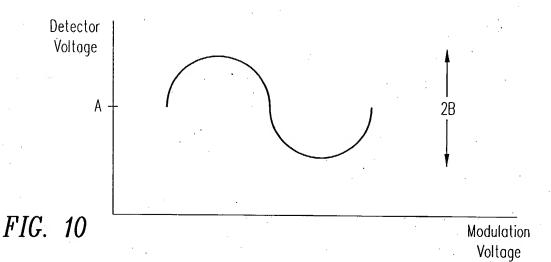


FIG. 8





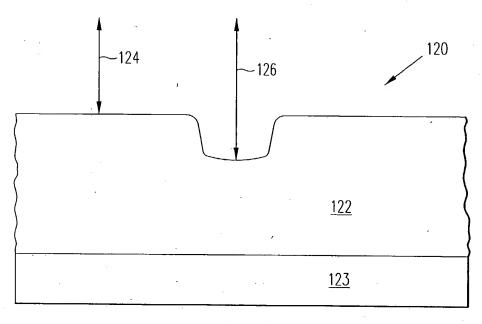


FIG. 11

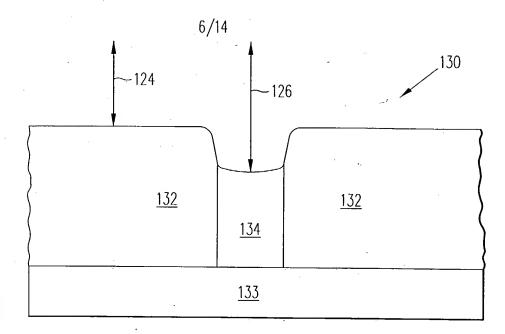


FIG. 12

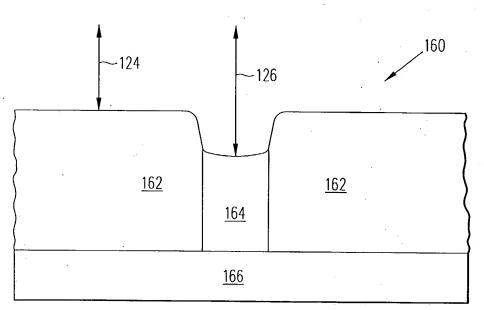


FIG. 15

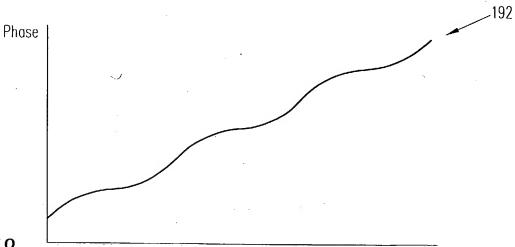


FIG. 18

Thickness

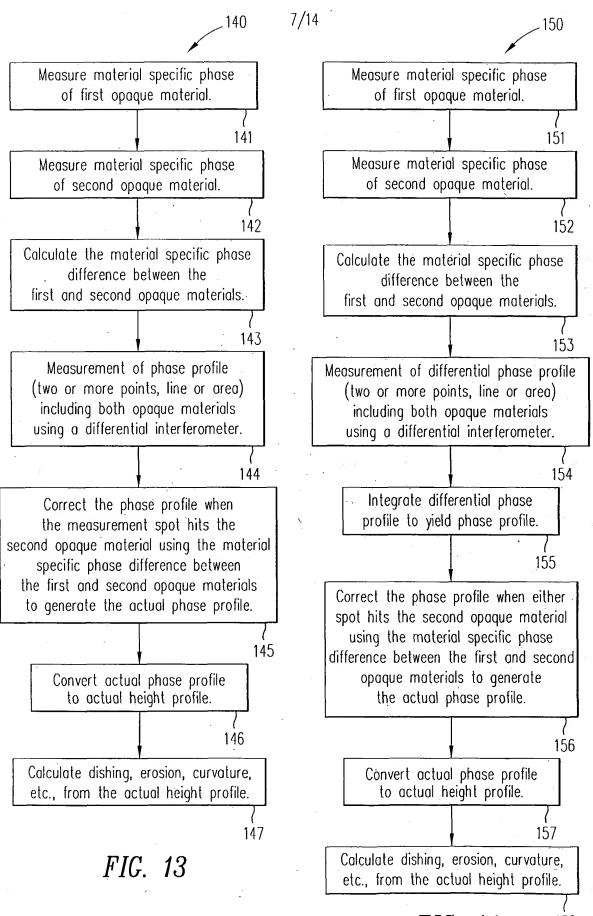
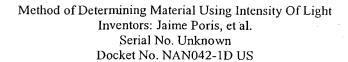
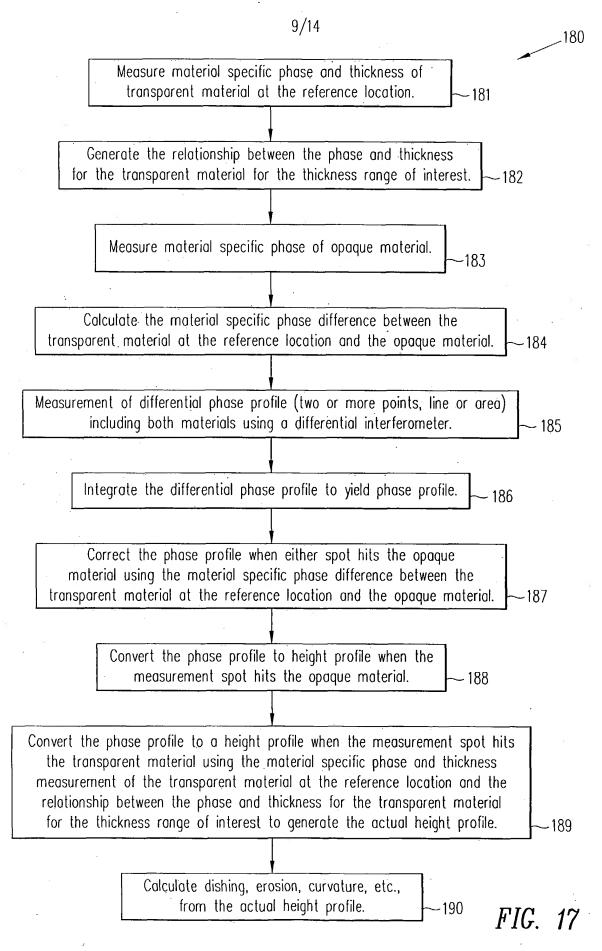


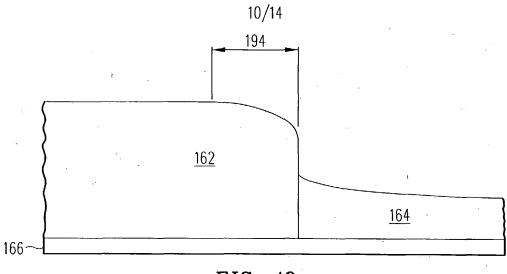
FIG. 14

158

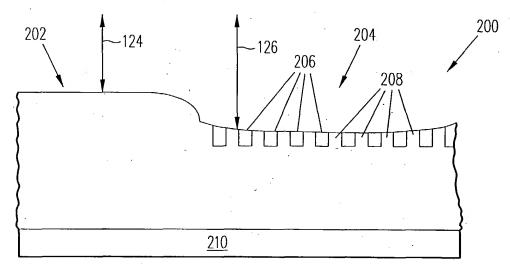


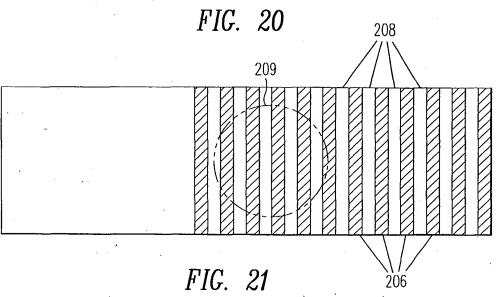
170 Measure material specific phase and thickness of transparent material at the starting measurement spot location. -171 Generate the relationship between the phase and thickness for the transparent material for the thickness range of interest. -172 Measure material specific phase of opaque material. 173 Calculate the material specific phase difference between the transparent material at the starting measurement spot location and the opaque material. -174 Measurement of phase profile (two or more points, line or area) including both materials using a differential interferometer. Correct the phase profile when the measurement spot hits the opaque material using the material specific phase difference between the transparent material at the starting measurement spot location and the opaque material. 176 Convert the phase profile to height profile when the measurement spot hits the opaque material. 177 Convert the phase profile to a height profile when the measurement spot hits the transparent material using the material specific phase and thickness measurement of the transparent material at the starting measurement spot location and the relationship between the phase and thickness for the transparent material for the thickness range of interest to generate the actual height profile. -178 Calculate dishing, erosion, curvature, etc., from the actual height profile. 179 FIG. 16

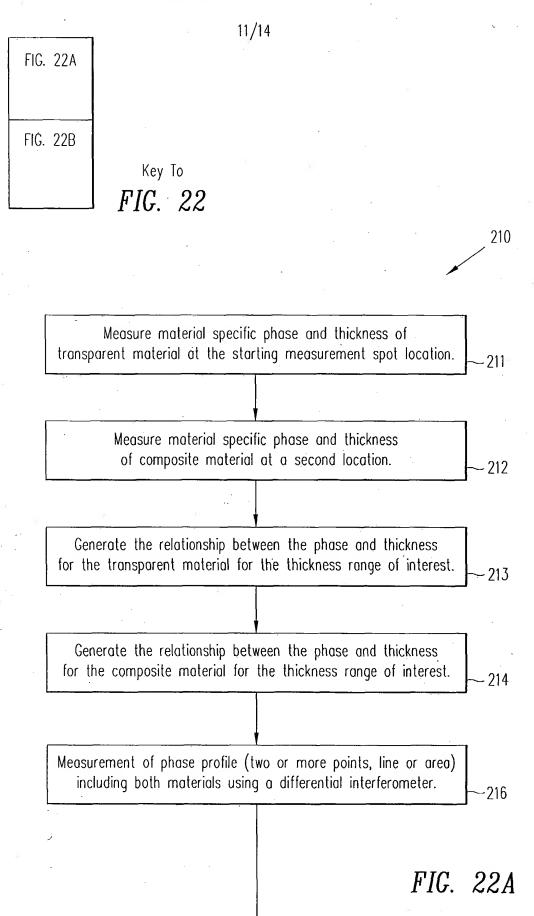












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Convert the phase profile to a height profile when the measurement spot hits the transparent material using the material specific phase and thickness measurement of the transparent material at the starting measurement spot location and the relationship between the phase and thickness for the transparent material for the thickness range of interest.

218

Convert the phase profile to a height profile when the measurement spot hits the composite material using the material specific phase and thickness measurement of the composite material at the second location and the relationship between the phase and thickness for the composite material for the thickness range of interest to generate the actual height profile.

219

Calculate dishing, erosion, curvature, etc., from the actual height profile.

-220

FIG. 22B

Inventors: Jaime Poris, et al. Serial No. Unknown Docket No. NAN042-1D US 13/14 FIG. 23A FIG. 23B Key To FIG. 23 Measure material specific phase and thickness of transparent material at the starting measurement spot location. Measure material specific phase and thickness of composite material at a second location. 232 Generate the relationship between the phase and thickness for the transparent material for the thickness range of interest. Generate the relationship between the phase and thickness for the composite material for the thickness range of interest. 234 Calculate the material specific phase difference between the transparent material at the starting measurement spot location and the composite material at the second location. 235 Measurement of differential phase profile (two or more points, line or area) including both materials using a differential interferometer. 236 Integrate the differential phase profile to yield the phase profile. 237

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FIG. 23A

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Correct the phase profile when one spot hits the transparent material and one spot hits the composite material using the material specific phase difference between the transparent material and the composite material.

238

Convert the phase profile to a height profile when the measurement spot hits the transparent material using the material specific phase and thickness measurement of the transparent material at the starting measurement spot location and the relationship between the phase and thickness for the transparent material for the thickness range of interest.

-239

Convert the phase profile to a height profile when the measurement spot hits the composite material using the material specific phase and thickness measurement of the composite material at the second location and the relationship between the phase and thickness for the composite material for the thickness range of interest to generate the actual height profile.

-240

Calculate dishing, erosion, curvature, etc., from the actual height profile.

-241

FIG. 23B